

Appl. No. 10/697,312

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Status of Claims

Claims 1 to 31 remain in the application.

Amendments to Claims

Two minor corrections have been made to the claims. In claim 23, the word "potion" has been replaced with "portion". In claim 27, a comma in the preamble has been removed.

35 U.S.C 102 Claim Rejections

Controlling case law has frequently addressed rejections under 35 U.S.C. § 102. "For a prior art reference to anticipate in terms of 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference." Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 677, 7 U.S.P.Q.2d 1315, 1317 (Fed. Cir. 1988; emphasis added). The disclosed elements must be arranged as in the claim under review. See Lindemann Machinefabrik v. American Hoist & Derrick Co., 730 F.2d 1452, 1458, 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984). If any claim, element, or step is absent from the reference that is being relied upon, there is no anticipation. Kloster Speedsteel AB v. Crucible, Inc., 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986; emphasis added). The following analysis of the present rejection is respectfully offered with guidance from the foregoing controlling case law decisions.

The Examiner has rejected claims 1 to 4, 6, 14 to 16, 18 and 25 to 29 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0185566 (Nishi *et al.*, hereinafter Nishi).

With regard to claim 1, the Examiner alleges that Nishi discloses "redirecting around the optical component the protection portion of the optical signal" in the form of, in the Examiner's own words, "output of 64 in figure 15 goes to another output of the switch". Applicant disagrees with the Examiner's allegation and characterization of Nishi.

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Claim 1 recites a method for splitting a multi-wavelength optical signal, which includes a plurality of optical signals, to obtain a protection portion of the multi-wavelength optical signal, the protection portion including protection portions of each of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 11, line 1 to page 12, line 2. A further step involves redirecting around the optical component the protection portion including the protection portions of each of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 13, lines 4 to 17. A further step involves wavelength filtering the protection portion to obtain the protection portion of a particular optical signal of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 15, line 20 to page 16, line 10. Wavelength filtering to obtain the protection portion is recited as being performed after the protection portion of the multi-wavelength optical signal is redirected around the optical component.

In paragraph [0115] Nishi discloses:

"When, in the input circuit described above, an arbitrary optical signal λ_x of a plurality of optical signals λ_1 through λ_n is not input due to some failure, the wavelength selector 64 selects an optical signal with wavelength λ_x from the WDM light and outputs the selected signal."

Nishi discloses that wavelength selector 64 selects a single optical signal having a wavelength λ_x and then provides this signal to the switch. Therefore, Nishi does not disclose "redirecting around the optical component the protection portion of the multi-wavelength optical signal" (emphasis added) as recited in claim 1, but instead discloses selecting a single wavelength signal and passing the single wavelength signal through a switch.

The Examiner alleges that Nishi discloses "wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of the particular optical signal" in the form of, in the Examiner's own words, "64 and 65 in Figure 15, Nishi used both to filter 71-n in Figure 15". As discussed above wavelength selector 64 is utilized prior to redirecting the single wavelength optical signal.

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As Nishi does not disclose all the elements recited in claim 1, Nishi cannot anticipate claim 1. Applicant submits that claim 1 is novel and patentably distinguish over Nishi.

Claim 14 is a device claim. Claim 14 recites similar subject matter to method claim 1. For at least the reasons discussed above with regard to claim 1, Applicant submits claim 14 is novel and patentably distinguish over Nishi.

Claims 2 to 4 and 6 are dependent on claim 1 and claims 15, 16 and 18 are dependent on claim 14. Applicant submits these claims are allowable for at least the same reasons as independent claims 1 and 14.

With regard to independent claims 25 and 27, the Examiner alleges that Nishi discloses “wavelength filtering access to the optical communication system from the protection pathway such that no invalid optical signals are transmitted to the system from the protection pathway”. The Examiner equates “wavelength filtering” as recited in claims 25 and 27 with the use of fixed wavelength converter 71-n in Figure 15 of Nishi, “invalid optical signals” as recited in claims 25 and 27 with “failed signals” as disclosed in Nishi and “the protection pathway” as recited in claims 25 and 27 with the path connecting to combiner 76 in Figure 15 as disclosed in Nishi.

Applicant disagrees with the Examiner’s equating of “wavelength filtering” as recited in claims 25 and 27 with the use of fixed wavelength converter 71-n in Figure 15 of Nishi. Elements 71-1 to 71-n are disclosed in Nishi to be fixed wavelength converters which “converts the wavelength of an optical signal from the optical switch 13 into a corresponding wavelength” (paragraph [0116]). Element 74 is a variable wavelength converter that “converts the wavelength of a supplied optical signal into a wavelength designated by the operating system” (paragraph [0117]). The fixed or variable wavelength converters in Nishi are disclosed as being used to convert a particular received wavelength into a corresponding wavelength. A tunable optical filter as recited in claim 27 for example is a filter used to select one or more particular wavelengths from a group of wavelengths in a given bandwidth. Applicant submits that a fixed or variable wavelength converter is not the same as a tunable optical filter as recited in claim 27, and does not perform wavelength filtering as recited in claim 25.

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Applicant disagrees with the Examiner's equating of "invalid optical signals" as recited in claims 25 and 27 with "failed signals" as disclosed in Nishi. Nishi discloses in paragraph [0118] that "if an arbitrary optical signal λ_x of a plurality of optical signals cannot be output due to some failure, the optical switch 13 guides corresponding optical signal to the variable wavelength converter 74". Furthermore, according to Nishi, a "failed signal" does not pass through the switch and therefore the corresponding signal is selected using wavelength selector 64 and routed through another path of the switch. A "failed signal" according to Nishi occurs as a result of a failure in the switch, therefore a failed signal will not pass through a protection path which includes optical splitter 61, wavelength selector 64, adjustable wavelength converter 74 and optical combiner 76. Nishi does not suggest or disclosure any other types of "invalid signals" that would traverse the path of optical splitter 61, wavelength selector 64, adjustable wavelength converter 74 and optical combiner 76. Furthermore, Nishi does not disclose how the fixed or variable wavelength converters would perform wavelength filtering in a manner that they would not allow invalid signals to be transmitted to the system from the protection pathway.

As Nishi does not disclose all the elements recited in claims 25 and 27, Nishi cannot anticipate claims 25 and 27. Applicant submits that claims 25 and 27 are novel and patentably distinguish over Nishi.

Claim 26 is dependent upon claim 25. The Examiner does not equate the "tunable optical filter" recited in claim 26 to any of the elements in Nishi. The Examiner alleges that "controllably tuning the filter such that no invalid optical signal passes through" as recited in claim 26 is disclosed in Nishi in the form of, in the Examiner's own words, "the filter tunes to whichever wavelength is not valid or not output and amplifies it if need be". Applicant disagrees with the Examiner's allegation. Firstly, Applicant submits that Nishi does not disclose a tunable filter, but instead discloses a wavelength converter. Secondly, the Examiner's statement does not make sense to ensure an invalid optical signal does not pass through. The Examiner suggests tuning to a wavelength that includes an invalid signal and amplifying it. Applicant submits that based on such a process the invalid signal would pass through not be stopped from passing through.

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For at least the reasons discussed above, Applicant submits that Nishi does not disclose all the limitations recited in claim 25, upon which claim 26 depends. Furthermore, Nishi does not disclose a "tunable optical filter" or "controllably tuning the filter such that no invalid optical signal passes through" as recited in claim 26. As Nishi does not disclose all the elements recited in claim 26, Nishi cannot anticipate claim 26. Applicant submits that claim 26 is novel and patentably distinguishes over Nishi.

With regard to claim 28, the Examiner alleges that Nishi discloses an ingress trunk line card including an optical splitter and a redirecting means. Claim 28 recites an ingress trunk line card including an optical splitter and a redirecting means "coupled to the optical splitter for redirecting around the dedicated switching fabric the protection portion of the multi-wavelength optical signal" (emphasis added). As discussed above with regard to claim 1, Nishi does not disclose redirecting the protection portion of the multi-wavelength optical signal around an optical component, for example a dedicated switching fabric. Nishi discloses supplying a single optical signal of wavelength λ_x to a switch.

As Nishi does not disclose all the elements recited in claim 28, Nishi cannot anticipate claim 28. Applicant submits that claim 28 is novel and patentably distinguishes over Nishi.

With regard to claim 29, the Examiner alleges that Nishi discloses an egress trunk line card including: "redirecting means for redirecting around the dedicated switching fabric a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals" in the form of, in the Examiner's own words, "the protection waveguide is used to redirect the wavelength signal at splitter 61 in Figure 15". As discussed above, Nishi discloses selecting a single wavelength signal from a plurality of wavelengths, providing that single wavelength signal on a protection path to a switch and the switch providing the single wavelength to a wavelength converter, not redirecting around the dedicated switching fabric a protection portion of the multi-wavelength optical signal. Furthermore, the element that the Examiner refers to as part of the protection waveguide used to redirect the wavelength signal, that is splitter 61 in Figure 15, is an element in Nishi that is more consistent with an ingress line card rather than an egress line card.

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Also with regard to claim 29, the Examiner alleges that Nishi discloses "a tunable optical filter coupled to the redirecting means for wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of a particular optical signal which would have been affected by the failure" in the form of element 71-n in Figure 15. For reasons elaborated upon in greater detail above, Applicant submits that a fixed or variable wavelength converter is not the same as a tunable optical filter as recited in claim 29.

For at least the above reasons, Applicant submits that Nishi does not disclose "redirecting around the dedicated switching fabric a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals" or "a tunable optical filter coupled to the redirecting means for wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of a particular optical signal which would have been affected by the failure".

As Nishi does not disclose all the elements recited in claim 29, Nishi cannot anticipate claim 29. Applicant submits that claim 29 is novel and patentably distinguishes over Nishi.

Applicant respectfully requests that the Examiner reconsider and withdraw the anticipation rejection of claims 1 to 4, 6, 14 to 16, 18 and 25 to 29.

35 U.S.C 103 Claim Rejections

The requirements for establishing a *prima facie* case of obviousness as set out in the MPEP Section 2143.01 require that the reference or references when combined teach all of the claimed limitations, that there be a reasonable expectation of success in realizing the claimed invention, and that there be a motivation to combine the references.

The Examiner has rejected claims 8 to 11, 20 to 22, 30 and 31 under 35 U.S.C. 103(a) as being unpatentable over Nishi.

With regard to claim 8, the Examiner alleges that Nishi discloses "A method of protecting any one of a plurality of optical signals from failure of an optical component". Claim 8 in fact recites "A method of protecting any one of a plurality of separate optical signals from failure of

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an optical component" (emphasis added). The plurality of optical signals in claim 8 are not a plurality of wavelength division multiplexed signals on a single fiber, as illustrated for example in the input to input circuit 60-1 in Figure 15 of Nishi, but are separate signals each having a single wavelength as illustrated, for example in Figures 2 or 4 of the present application as reference character 31 or Figure 5 of the present application as reference character 61.

The Examiner alleges that Nishi discloses "optically splitting each of the separate optical signals to obtain a corresponding protection portion of each optical signal" in the form of element 61 in Figure 15. In Figure 15 of Nishi, element 61 is an optical splitter that splits input WDM (wavelength division multiplexed) light, such that all of the multi-wavelength optical signals in the optical signal applied to the optical splitter 61 are provided to both optical amplifier 62 and wavelength selector 64. Therefore, Nishi does not disclose "optically splitting each of the separate optical signals to obtain a corresponding protection portion of each optical signal" as recited in claim 8.

The Examiner alleges that Nishi discloses "redirecting around the optical component the multi-wavelength optical signal" and "wavelength filtering the multi-wavelength optical signal to obtain the protection portion of the particular optical signal". For similar reasons as discussed above with regard to claim 1, Applicant submits that Nishi does not disclose "redirecting around the optical component the multi-wavelength optical signal" or "wavelength filtering the multi-wavelength optical signal to obtain the protection portion of the particular optical signal" (emphasis added).

The Examiner concedes that Nishi does not disclose "multiplexing the plurality of protection portions of each optical signal into a multi-wavelength optical signal" or following redirecting the multi-wavelength signal around the optical component, "demultiplexing the protection portion of the particular optical signal to further redirect it". The Examiner submits that Nishi does not disclose the steps of multiplexing and demultiplexing because the signals are already multiplexed on one fiber. The Examiner alleges that in doing so Nishi removes the need for multiplexing and demultiplexing as is recited in claim 8. Applicant submits that a key difference between the embodiment recited in claim 8 and the embodiment of Figure 15 of Nishi is the fact that Nishi operates on a single WDM signal having multiple wavelengths and claim 8

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recites separate signals that are then multiplexed using a multiplexer to generate the protection portion. Figure 5 of the present application clearly illustrates what is recited in the claim 8. Separate optical signals 61 are each optically split by optical splitters 62 and collectively multiplexed by wavelength multiplex (WM) 65. The resulting multi-wavelength signal 63 is redirected around the optical component and wavelength filtered to obtain a particular optical signal using tunable filter 77. This is different than what is disclosed in paragraphs [0111] to [0119] on page 8 of Nishi and illustrated in Figure 15.

For at least the reasons discussed above, Applicant submits that Nishi does not disclose what is recited in claim 8. Therefore, Nishi does not teach all the limitations of claim 8. It is submitted that the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, namely that all the limitations of the claim are disclosed.

Independent claim 20 is a device claim that recites similar subject matter to method claim 8. Applicant submits that claim 20 patentably distinguishes over Nishi for at least the same reasons as discussed with regard to claim 8.

Claims 9 to 11 are dependent upon claim 8, either directly or indirectly, and claims 21 and 22 are dependent upon claim 20, either directly or indirectly. Applicant submits that claims 9 to 11, 21 and 22 patentably distinguish over the cited references for at least their dependence on inventive claims 8 and 20.

Furthermore, with respect to claim 22, the Examiner alleges that Nishi discloses "an optical combiner coupled to an output of the tunable optical filter for optically combining the protection portion of the particular optical signal after it has passed through the tunable filter". Claim 22 in fact recites "a plurality of optical combiners optically coupled to a plurality of outputs of the demultiplexer for optically combining the protection portion of the particular optical signal after it has been demultiplexed". In each of output circuits 70-1 through 70-k, there is only a single combiner 76 that combines a single wavelength signal output from variable wavelength converter 71-n with the output of optical multiplexer 72. Therefore, Nishi does not disclose what is recited in claim 22.

Claim 30 recites an ingress tributary card comprising:

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"a plurality of optical splitters for optically splitting each of the optical signals to obtain a corresponding protection portion of each optical signal; a multiplexer coupled to first outputs of the splitters for multiplexing the plurality of protection portions of each optical signal into a multi-wavelength optical signal; and redirecting means coupled to an output of the multiplexer for redirecting around the dedicated switching fabric the multi-wavelength optical signal" (emphasis added).

For similar reasons described above with regard to claim 8, Applicant submits that Nishi does not disclose a plurality of optical splitters or a multiplexer. In each of input circuits 60-1 through 60-k, there is only a single splitter 61 that splits a multi-wavelength WDM signal, not a plurality of optical splitters for splitting each of a plurality of optical signals. Furthermore, as discussed above with regard to claim 28, Figure 15 of Nishi discloses that only a single wavelength is output from wavelength selector 64 and provided to the switch 13.

For at least the reasons discussed above, Applicant submits that Nishi does not disclose what is recited in claim 30. Therefore, Nishi does not teach all the limitations of claim 30. It is submitted that the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, namely that all the limitations of the claim are disclosed.

Claim 31 recites an egress tributary card comprising:

"redirecting means for redirecting around the dedicated switching fabric a multi-wavelength optical signal comprising protection portions of each of the optical signals; a tunable optical filter coupled to the redirecting means for wavelength filtering the multi-wavelength optical signal to obtain a protection portion of a particular optical signal which would have been affected by the failure; a demultiplexer coupled to an output of the tunable optical filter for demultiplexing the protection portion of the particular optical signal to further redirect it; and a plurality of optical combiners coupled respectively to a plurality of outputs of the demultiplexer for optically combining the protection portion of the particular optical signal after it has been demultiplexed to redirect it along an optical

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pathway the particular optical signal would have been directed along had the optical component not failed" (emphasis added).

For similar reasons described above with regard to claim 22, Applicant submits that Nishi does not disclose a plurality of optical combiners. For similar reasons described above with regard to claim 20, Applicant submits that Nishi does not disclose a demultiplexer. In each of output circuits 70-1 through 70-k, there is only a single combiner 76 that combines a single wavelength signal output from variable wavelength converter 71-n with the output of optical multiplexer 72. Furthermore, as discussed above with regard to claim 29, Nishi discloses that only a single wavelength is output from switch 13 and provided to wavelength converter 74, not a multi-wavelength signal as recited in claim 31. In addition, wavelength converter 74 that is disclosed in Nishi is not a tunable optical filter as recited in claim 31.

For at least the reasons discussed above, Applicant submits that Nishi does not disclose what is recited in claim 31. Therefore, Nishi does not teach all the limitations of claim 31. It is submitted that the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, namely that all the limitations of the claim are disclosed.

For at least the above-discussed reasons, it is respectfully submitted that the Examiner has failed to establish a *prima facie* case of obviousness. The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 8 to 11, 20 to 22, 30 and 31.

The Examiner has rejected claims 5, 12, 17 and 23 under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of U.S. Patent Application Publication No. 2002/0044322 (Blumenthal *et al.*, hereinafter Blumenthal).

Claims 5 and 17 are dependent upon claims 1 and 14, respectively, and claims 12 and 23 are dependent upon claims 8 and 20, respectively. Nishi does not disclose all the features of claims 5 and 17 for at least the reasons discussed above in response to the 35 U.S.C. 102 rejection of claims 1 and 14. Nishi does not disclose all the features of claims 12 and 23 for at least the reasons discussed above in response to the 35 U.S.C. 103 rejection of claims 8 and 20. Blumenthal does not disclose the features missing from Nishi and relied upon by the Examiner to be disclosed by Nishi.

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It is submitted that the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, namely that all the limitations of the claims are disclosed. As the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, Applicant submits that claims 5, 12, 17 and 23 patentably distinguishes over the cited references.

Applicant notes that Section 2143.01 of the Manual of Patent Examining Procedure (MPEP) sets out three possible sources of motivation to combine references, namely A) the nature of the problem to be solved, B) the teachings of the prior art, and C) the knowledge of persons of ordinary skill in the art. It is respectfully submitted that the Examiner has not established a motivation to combine the references from any one of the three sources.

The Examiner has stated that the motivation in combining Nishi and Blumenthal is "in order to monitor wavelength gain or loss variation". Applicant submits that the Examiner has failed to satisfy the onus of identifying any of the three possible sources for a motivation to combine in such a generic statement and thus the requirement to establish motivation to combine references for establishing a *prima facie* case of obviousness has not been satisfied for claims 5, 12, 17 and 23.

For at least the above-discussed reasons, it is respectfully submitted that the Examiner has erred in combining Nishi and Blumenthal in an attempt to establish a *prima facie* case of obviousness. The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 5, 12, 17 and 23.

The Examiner has rejected claims 7, 13, 19, 24 under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of U.S. Patent Application Publication No. 2002/0044322 (Caroli *et al.*, hereinafter Caroli).

Claims 7 and 19 are dependent upon claims 1 and 14, respectively, and claims 13 and 24 are dependent upon claims 8 and 20, respectively. Nishi does not disclose all the features of claims 7 and 19 for at least the reasons discussed above in response to the 35 U.S.C. 102 rejection of claims 1 and 14. Nishi does not disclose all the features of claims 13 and 24 for at least the reasons discussed above in response to the 35 U.S.C. 103 rejection of claims 8 and 20.

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Caroli does not disclose the features missing from Nishi and relied upon by the Examiner to be disclosed by Nishi.

It is submitted that the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, namely that all the limitations of the claims are disclosed. As the Examiner has failed to satisfy at least one requirement for a *prima facie* case of obviousness, Applicant submits that claims 7, 13, 19, 24 patentably distinguishes over the cited references.

The Examiner has stated that the motivation in combining Nishi and Caroli is "because it would rid the system of the bad signal output of the switch". Applicant submits that the Examiner has failed to satisfy the onus of identifying any of the three possible sources for a motivation to combine in such a generic statement and thus the requirement to establish motivation to combine references for establishing a *prima facie* case of obviousness has not been satisfied for claims 7, 13, 19, 24.

For at least the above-discussed reasons, it is respectfully submitted that the Examiner has erred in combining Nishi and Caroli in an attempt to establish a *prima facie* case of obviousness. The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 7, 13, 19, 24.

In view of the forgoing, early favorable consideration of this application is earnestly solicited.

Respectfully submitted,

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